



# PRODUCT/PROCESS CHANGE NOTIFICATION

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PCN APM-AAM/09/4591  
Notification Date 05/16/2009

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**HCMOS4PZ DIFFUSION TRANSFER FROM CARROLLTON 6" TO AMK 6"**

**Table 1. Change Implementation Schedule**

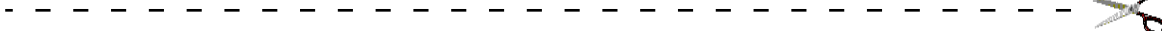
Forecasted implementation date for change	08-May-2009
Forecasted availability date of samples for customer	08-May-2009
Forecasted date for <b>STMicroelectronics</b> change Qualification Plan results availability	08-May-2009
Estimated date of changed product first shipment	27-Jul-2009

**Table 2. Change Identification**

Product Identification (Product Family/Commercial Product)	See Attached
Type of change	Waferfab location change
Reason for change	Restructuring Plan
Description of the change	Progressing along the Restructuring Plan already communicated by Corporate Information Letter (C.I.L.) CRP/07/2900 dated October 2, 2007 and APCN APM/07/3317 dated December 28, 2007, please be informed that the products currently manufactured in Carrollton 6" Plant (Texas, USA) by using HCMOS4PZ Technology, will be moved to our facilities located in Ang Mo Kio 6" Plant (Singapore). The relocation of the HCMOS4 Baseline Technology has been successfully qualified in the new plant and the full production ramp-up in the new site, began at the end of October 2008 as communicated by PCN APM/08/3892 dated July 31, 2008. The HCMOS4PZ follow-on Techno sub family has now been successfully qualified in the new plant. The full production ramp-up in the new site, has begun.
Product Line(s) and/or Part Number(s)	See attached
Description of the Qualification Plan	See attached
Change Product Identification	See Attached
Manufacturing Location(s)	

**Table 3. List of Attachments**

Customer Part numbers list	
Qualification Plan results	



Customer Acknowledgement of Receipt		<b>PCN APM-AAM/09/4591</b>				
Please sign and return to STMicroelectronics Sales Office		<b>Notification Date 05/16/2009</b>				
<input type="checkbox"/> Qualification Plan Denied <input type="checkbox"/> Qualification Plan Approved  <input type="checkbox"/> Change Denied <input type="checkbox"/> Change Approved	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">Name:</td></tr> <tr><td style="padding: 2px;">Title:</td></tr> <tr><td style="padding: 2px;">Company:</td></tr> <tr><td style="padding: 2px;">Date:</td></tr> <tr><td style="padding: 2px;">Signature:</td></tr> </table>	Name:	Title:	Company:	Date:	Signature:
Name:						
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## DOCUMENT APPROVAL

Name	Function
Mcdonagh, Gary	Division Marketing Manager
Sonnino, Ruben	Division Product Manager
Winn, Robert E	Division Q.A. Manager

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## **HCMOS4PZ DIFFUSION TRANSFER FROM CARROLLTON 6" TO AMK 6"**

### **WHAT:**

Progressing along the Restructuring Plan already communicated by Corporate Information Letter (C.I.L.) CRP/07/2900 dated October 2, 2007 and APCN APM/07/3317 dated December 28, 2007, please be informed that the products currently manufactured in Carrollton 6" Plant (Texas, USA) by using HCMOS4PZ Technology, will be moved to our facilities located in Ang Mo Kio 6" Plant (Singapore).

The relocation of the HCMOS4 Baseline Technology has been successfully qualified in the new plant and the full production ramp-up in the new site, began at the end of October 2008 as communicated by PCN APM/08/3892 dated July 31, 2008.

The HCMOS4PZ follow-on Techno sub family has now been successfully qualified in the new plant. The full production ramp-up in the new site, has begun.

The affected products are listed in the table attached. All the products manufactured by ST using the HCMOS4PZ Technology, even if not expressly included in the above mentioned table, are affected by this change.

### **WHY:**

In order to optimize ST asset utilization and enhance performance for shareholders and customers.

### **HOW:**

By transferring and re-qualifying the mentioned front-end technology in the receiving plant; this technology has been qualified through a full set of evaluations on the selected test vehicle (TV for technology qualification): T84, EWS, electrical characterization, die and package oriented stress tests; other products diffused in the same Technology will be qualified mainly by similarity (generic data) if assembled in the same package family.

Techno family	Techno sub family	TV Product	Line	Package	Product Group	Qualification Plan
HCMOS4 baseline	HCMOS4PZ	M48T35	48T3	SO	APM	TV for technology and BE compatibility

This transfer will not modify the electrical, dimensional and thermal parameters for the product affected, maintaining unchanged current information published on the relevant datasheets. There are no changes in the packing modes or in the standard delivery quantities either. The table here in appendix 1, is providing you the detailed qualification plan that has been used in the new location to qualify the affected test vehicle.

ST will focus on customer satisfaction and ensure a seamless transition in the supply of products from different sites.

### **WHEN:**

The transfer of all product lines and the ramp up in the new location will be finalized within **Q2 2009**.

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**Qualification program and results availability:**

The qualification program mainly consists of comparative electrical characterizations and reliability tests. The relevant reliability report is provided in appendix 1 of this document.

**Samples availability:**

Samples of the test vehicle used to qualify the HCMOS4PZ Technology in our AMK6 facility are already available, while for all the concerned products, samples will be available upon request to the relevant product Business Unit.

**Change implementation schedule:**

The production start and first shipments will be implemented according to our work in progress and materials availability as indicated in the schedule below:

<b>Product Family Code</b>	<b>Product Family Description</b>	<b>PCN date</b>	<b>1st Shipments</b>
<b>61</b>	<b>Advanced Analog</b>	<b>Week 19-2009</b>	<b>From Week 31-2009</b>

Lack of acknowledgement of the PCN within 30 days will constitute acceptance of the change. After acknowledgement, lack of additional response within the 90 day period will constitute acceptance of the change (Jedec Standard No. 46-C). In any case, first shipments may start earlier with customer's written agreement.

**Product's traceability:**

Unless otherwise stated by customer specific requirement, new parts produced in AMK6 will be differentiated as indicated below:

Diffusion plant	ID	Country of origin
Carrollton (current)	VH	USA
AMK6 (new)	V6	Singapore

Shipments from new Wafer FAB location will be tracked on the ST Standard Label as showed below:

Manufactured under patents or patents pending

Assembled in: 1234567890123456  
Pb-free 2nd Level Interconnect  
MSL: 1 Bag seal date: dd mm yyyy  
PBT: 260 C Category: xx ECOPACK/RoHS


**TYPE: 1234567890123456**  
**1234567890123456**

**Total Qty: 12345**

**Trace codes** PPYWWLL1 V6 TF  
PPYWWLL2 V6 TF

Marking 12345678901: 90

Bulk ID **1234567890123**



Please provide the bulk ID for any inquiry

**Wafer FAB area code will change from: VH to: V6**

**Generic ST Standard label**

Please note that ST Team is doing all the best for providing you full visibility about the announced restructuring Plan and to minimize any negative impact it may occurs. While our Marketing and Sales teams are available for additional information when required, we are looking forward to your renewed confidence in STMicroelectronics as the strategic partner of your choice.

Sincerely Yours.

Appendix 1: Reliability tests for qualification program.

<h1 style="margin: 0;">Reliability Report</h1> <p style="margin: 10px 0;"><i>On HCMOS4PZ Technology</i></p> <p style="margin: 0;"><i>Test Vehicle: M48T35Y</i></p>
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General Information		Locations	
<b>Product Line</b>	<b><i>CK6AA5TZ</i></b>	<b>Wafer fabrication location</b>	<b><i>AMK6</i></b>
<b>Product Description</b>	<b><i>Timekeeper/ Zeropower Sram</i></b>	<b>Assembly plant location</b>	<b><i>Muar, Malaysia</i></b>
<b>Commercial Product</b>	<b><i>M48T35Y</i></b>	<b>Final test plant location</b>	<b><i>Muar, Malaysia</i></b>
<b>Product Group</b>	<b><i>APM GROUP</i></b>		
<b>Product Division</b>	<b><i>Advanced Analog and Mixed Signal</i></b>		
<b>Package Description</b>	<b><i>SOIC 28L</i></b>		
<b>Silicon Process Technology</b>	<b><i>HCMOS4PZ</i></b>		

### DOCUMENT HISTORY

Version	Date	Pages	Author	Comment
0.1	May-01-2009		R. Winn / D. Lieberenz	Original document

**Reliability is the attitude of element to satisfy required function in fixed conditions during established time.**



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Note: This report is a summary of the reliability trials performed in good faith by STMicroelectronics in order to evaluate the potential reliability risks during the product life using a set of defined test methods.

This report does not imply for STMicroelectronics expressly or implicitly any contractual obligations other than as set forth in STMicroelectronics general terms and conditions of Sale. This report and its contents shall not be disclosed to a third party without previous written agreement from STMicroelectronics.

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# **1 RELIABILITY EVALUATION OVERVIEW**

## **1.1 Objectives**

The purpose of this report is to present the results of the reliability evaluations performed on the M48T35Y device used as a test vehicle in order to qualify the transfer of HCMOS4PZ technology in AMK6.

This product is assembled in SOIC 8L in Muar, Malaysia.

## **1.2 Conclusion**

The final reliability results are positive for all stressed lots.

# **2 DEVICE CHARACTERISTICS**

## **2.1 Device description**

The test vehicle is a Timekeeper/ Zeropower Sram device.

## **2.2 Traceability**

### **2.2.1 Wafer fabrication information**

- Wafer fabrication manufacturing location: Ang Mo Kio 6" in Singapore
- Technology: HCMOS4PZ
- Die size: 159 mils x 165 mils
- Passivation type: Plasma Nitride

### **2.2.2 Assembly information**

Assembly site	Muar, Malaysia
Package description	SOIC 28L
Frame	Copper
Wire	Au 1 mil

### 3 RELIABILITY TESTS RESULTS

#### 3.1 Reliability test plan and results summary

##### Die oriented test

Test	Test short description				
	Method	Conditions	Sample size	Duration	Fail/ tested
T.H.B.	Temperature Humidity Bias				
		85°C / 85%RH Vcc = 5.5V	3 Lots / 77	959 H	0/77
HTB	High Temperature Bias				
		125°C Vcc = 6.0V	3 Lots / 540	1000 H	0/540

##### Package oriented test

Test	Test short description				
	Method	Conditions	Sample size	Duration	Fail/ tested
TC	Temperature Cycle				
		-65°C / 150°C	3 Lots / 180	500 C	0/180
HTS	High Temperature Storage				
		150°C	3 Lots / 77	1000 H	0/77
P.C.	Pre Condition				
		85°C / 85%RH Level13; 260 °C	3 Lots/ 340	168 H	0/340

##### ESD tests

ESD Model	Stress voltage (V)	Fail / tested
HBM	2000	0 / 18
RCDM	1000	0 / 8

All tests above are compliant with below standards:

- MIL883C
- JEDEC JESD22

##### Latch-Up tests

L/U	Stress Condition	Fail / tested
Positive Current Injection	+ 200ma; 11.0v	0 / 15
Negative Current Injection	- 200ma; 0.6v	0 / 15
Over Voltage	+ 500ma; 10.0v	0 / 15

All tests above are compliant with below standards:

- EIA/JESD 78A

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### **3.2 Die oriented tests**

These tests are performed in order to demonstrate the quality and reliability of devices subjected to an elevated temperature and reverse biased. The purpose of this test is to detect surface defects such as poor passivation, presence of contaminants, metal corrosion, etc

### **3.3 Package oriented tests**

These tests are performed in order to check device life in various environmental conditions in an accelerated way. Detectable failure mechanisms are metal corrosion and molding defect, cracking of die, breaking of wire bonding, and mechanical damage to the device case.

## **4 APPLICABLE AND REFERENCE DOCUMENTS**

<b>Document reference</b>	<b>Short description</b>
AEC-Q100	Stress test qualification for integrated circuits
SOP 2610	General product qualification procedure
Internal ST specification	Reliability Tests and criteria for qualifications (Corporate Q&R rules)

## **5 GLOSSARY**

<b>ESD</b>	Electro Static Discharge
<b>LU</b>	Latch Up
<b>HTB</b>	High Temperature Bias
<b>HTS</b>	High Temperature Storage
<b>T.H.B.</b>	Temperature Humidity Bias
<b>T.C.</b>	Thermal Cycle
<b>P.C.</b>	Preconditioning

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